CARTO system. The 4 unsuccessful sites were located 1.6-1.9 cm from the balloon's surface and had P-potential amplitude of 0.05 - 0.29 (median 0.18) mV. The activation time of the 33 reconstructed P-potentials differed from the activation time measured by the contact catheter by 0-5 (median 2) msec.
Conclusions: The non-contact mapping system consistently reconstructs discrete P-potentials within 1.5 cm of the surface of the balloon. Low amplitude potentials generated further than 1.5 cm may not be identified.

1114-18 **Improvement of Ventricular Function Following Catheter Ablation of Frequent Ventricular Arrhythmias**

Mandeep Bhargava, Mark J. Niebauer, Mina K. Chung, Robert Schweikert, Patrick J. Tchou, The Cleveland Clinic Foundation, Cleveland, OH

Incessant supraventricular tachycardia may be result in reduction of left ventricular function. This is usually termed tachycardia-induced cardiomyopathy and can be reversed by pharmacologic suppression or radiofrequency catheter ablation (RCA)of the arrhythmia. However, RCA is also successful in reducing frequent ventricular ectopy in patients. We hypothesized that successful RCA of patients with idiopathic cardiomyopathy and frequent ventricular ectopy may improve their left ventricular function. Methods: We performed a retrospective analysis of the change in the left ventricular ejection fraction (LVEF) in patients with baseline left ventricular dysfunction in the absence of identifiable cause who underwent successful RCA at our center. Methods: The LVEF was determined by transthoracic echocardiography obtained from the patient's records before and after the procedure. The mean number of ventricular ectopic beats (VEB) per hour was assessed by 24 hour Holter monitoring before and between 1-12 months after the ablation procedure. Results: A total of 18 patients were identified which included 16 males and 2 females. Each patient underwent RCA for frequent ventricular ectopy and/or repetitive monomorphic VT. The mean age of the patients was 44.4 ± 17.7 years (range 18-81yrs). The VEBs per hour declined significantly from 1308 ± 859 to 46 ± 123 ($p<0.005$). Meanwhile, there was an improvement of the mean LVEF from 33.2 ± 6.4% to 45.6 ± 7.5% ($p<0.001$) following RCA with no syncope or significant ventricular arrhythmias in follow-up. Conclusion: Successful treatment with RCA significantly reduced the frequency of ventricular ectopy and simultaneously improved LVEF in this select group of patients. While such patients may also be considered candidates for implantable defibrillators, given their initial poor LVEF, our data suggest LVEF improvement may result from RCA alone. Since left ventricular dysfunction is an important factor in determining survival risk in patients with ventricular arrhythmias, further study is warranted to determine if long term survival is improved by successful RCA of frequent ventricular ectopy when there is no other etiology of reduced ventricular function.

POSTER SESSION

1115 Insights Into the Electrocardiogram and Clinical Syndromes

Monday, March 31, 2003, Noon-2:00 p.m.
McCormick Place, Hall A
Presentation Hour: 1:00 p.m.-2:00 p.m.

1115-3 **80-Lead Body Surface Map Compared With Physician and 12-Lead ECG in Detection of Acute Myocardial Infarction**

Anthony J. McClelland, Ian B. Menown, Jennifer Adgey, Royal Victoria Hospital, Belfast, United Kingdom, The Queen's University, Belfast, United Kingdom

Background: Improved spatial ECG sampling with Body Surface Mapping (BSM) has been shown to increase detection of acute myocardial infarction (AMI). We compared, prospectively, a BSM algorithm with a 12-lead ECG algorithm (12SL™V233) and a physician's 12-lead ECG interpretation in emergency patients with suspected AMI.
Methods: From December 2001 until April 2002 103 patients were recruited consecutively. All patients presented with ischemic type chest pain and had a BSM and 12-lead ECG (Marquette Mac 5K) recorded. The following were documented for each patient; the BSM algorithm diagnosis, 12-lead ECG algorithm diagnosis, the admitting physician's 12-lead ECG interpretation and Troponin-I (cTnI) or CKMB at 12 hours post onset of symptoms. AMI was defined by presentation with chest pain and an elevation of cTnI>1μg/L or CKMB>25U/L. Comparisons were evaluated by McNemar's test.
Results: 53 of the 103 patients had AMI as defined by elevated cTnI or CKMB. The 12-lead ECG algorithm diagnosed 17 patients with AMI (sensitivity 32%, specificity 98%), the admitting physician 24 patients with AMI (sensitivity 45%, specificity 94%) and the BSM algorithm 34 patients with AMI (sensitivity 64%, specificity 94%). The BSM algorithm improved the diagnostic yield by a factor of 2.0 ($p<0.001$) and 1.4 ($p=0.002$) compared with the 12-lead ECG algorithm or the admitting physician respectively. There was no significant difference in specificity.
Conclusion: The BSM algorithm improves detection of AMI with no significant loss of specificity compared with the 12-lead ECG algorithm or physician's 12-lead ECG interpretation. These results are of significance particularly in the early detection and management of AMI

1115-4 **Are Differences in the ECG Repolarization Patterns Between Males and Females Determined by Sex Hormones?**

Sanjay R. Parikh, Borys Surawicz, Indiana Heart Institute at St. Vincent Hospitals, Indianapolis, IN

Background: Differences in ventricular repolarization between males and females electrocardiograms (ECGs)have been described. The causes of these differences are not known, but hormonal influences are suspected. We hypothesized that such influences could be revealed by studying the distribution of repolarization patterns among genders within various age groups. **Methods:** We defined repolarization pattern as male when the amplitude of J-point was ≥ 0.1mV and the angle between ST segment and baseline (ST angle) was ≥ 20 degrees, in one or more of the leads V1-V4. Normal ECGs from 529 males and 544 females, ages 5-96 years were studied. The ECGs were distributed among 9 age groups, with a similar number of ECGs in each sub-group of males and females. **Results:** The distribution of ECG repolarization pattern in males was as follows: In children under the age of 12 years, 60% of ECGs showed male pattern. The prevalence of male pattern increased thereafter, reaching 91% in the age group 17-24 years. It progressively declined with advancing age bottoming out at 14% in males of age 76-96 years. Comparison of pattern distribution between age groups in males was significant ($p < 0.001$). In females, 73% of children under the age of 16 showed a female pattern, 84% of all females older than 16 years showed a female pattern. Comparison between genders showed a significant difference in the overall distribution of patterns ($p < 0.001$). Heart rate did not influence the repolarization pattern. **Conclusions:** Whereas the distribution of male and female repolarization patterns was nearly constant in females across all age groups, the males showed a progressive increase in the male pattern from childhood to puberty, followed by a gradual decline through rest of life. This appears to parallel the change in male hormone levels at puberty and a decline in these levels in elderly males. Our findings support the hypothesis that gender differences in ECG repolarization are of hormonal origin.

1115-5 **Prognostic Value of the Admission Electrocardiogram in Non-ST Elevation Acute Coronary Syndromes Treated With Very Early Revascularization**

Christian Mueller, Franz-Josef Neumann, Wolfgang Perach, Helmut Roskamm, André P. Perruchoud, Heinz J. Buettner, University Hospital, Basel, Switzerland, Herz-Zentrum, Bad Krozingen, Germany

Background: Limited information is available regarding the prognostic impact of the different presentations of acute myocardial ischemia on the admission electrocardiogram (ECG) in patients treated with very early revascularization for no-ST-elevation acute coronary syndromes (NSTACS). **Methods:** We conducted a prospective cohort study in 1450 consecutive NSTACS patients stratified according to the presence of new ST-segment depression, new T-wave inversion or no ECG changes on admission. All patients underwent coronary angiography and if appropriate subsequent revascularization within 24 hours of admission. The primary endpoint was all-cause mortality and recorded for a mean of 20 months. **Results:** In-hospital mortality was 2.1% in patients with no ECG changes, 4.4% in patients with ST-segment depression, and 0.2% in patients with T-wave inversion. Cumulative rates of death at 36 months were 8.0% in patients with no ECG changes, 19.1% in patients with ST-segment depression, and 5.1% in patients with T-wave inversion ($p=0.0001$ by log-rank). After adjusting for potential cofounders, both, ST-segment depression (hazard ratio 2.2) and T-wave inversion (hazard ratio 0.4) were found to be significant independent predictors of long-term mortality. **Conclusion:** New ST-segment depression and new T-wave inversion on the admission ECG herald a very different prognosis in NSTACS patients undergoing very early revascularization. In contrast to the considerable morbidity and mortality seen in patients with ST-segment depression, T-wave inversion is associated with an excellent outcome independently of potential cofounders including sex.

1115-6 **Repolarization Complexity and Abnormality for Prediction of All-Cause and Cardiovascular Mortality: The Strong Heart Study**

Peter M. Okin, Marek Malik, Katerina Hnatkova, Richard R. Fabsitz, Elisa T. Lee, James M. Galloway, Barbara V. Howard, Richard B. Devereux, Weill Medical College of Cornell University, New York, NY, St. George's Hospital Medical School, London, United Kingdom

Background: Analysis of repolarization abnormality and complexity on the ECG using the QTc interval and principal component analysis (PCA) of the T-wave vector have been demonstrated to predict all-cause and cardiovascular (CV) mortality. Novel descriptors of T-wave morphology have been suggested as measures of repolarization heterogeneity and as markers of adverse prognosis. However, whether these new T-wave descriptors provide additional prognostic information beyond QTc and the PCA ratio has not been examined.
Methods: Predictive values of QTc, PCA, and novel ECG variables characterizing the T-wave loop were assessed in 1729 American Indian participants in the first Strong Heart Study exam with all T-wave measurements. T-loop morphology was quantified by the ratio of the second to first eigenvalues of the T-wave vector (PCA ratio),by the T-loop area (TLA) projected onto the dominant vector plane and by the sum of the squares of the 4^{th} to 8^{th} eigenvectors, the absolute T-wave residuum (TWR).
Results: After mean follow-up of 3.7±0.9 years, there were 168 deaths from all causes, including 55 CV deaths. In univariate analyses, prolonged QTc, increased PCA ratio, TLA and TWR were significant predictors of all-cause and cardiovascular mortality ($p<.001$). In multivariate analyses adjusting for age, sex, body mass index, diastolic and systolic blood pressures, HDL and LDL cholesterol levels, triglyceride level, albuminuria, alcohol use, prevalent diabetes and coronary heart disease, history of smoking and study